

**REMARKS**

The Examiner rejected applicants' claims 1, 9 and 13 under 35 U.S.C. §102(b) as being anticipated by Cohn (US 5, 102, 829, hereinafter "Cohn"). Claims 2-4, 10-12 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cohn in view of Glenn (US 5, 962, 810, hereinafter "Glenn"). Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Cohn in view of Ogihara et al. (US 4, 965, 660, hereinafter "Ogihara"). Claims 6-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cohn in view of Glenn, as applied to claims 2-4, and further in view of Ogihara. Applicants respectfully request withdrawal of the rejection under 35 U.S.C. §§102(b), 103(a).

Anticipation under 35 U.S.C. § 102(b) (Cohn):

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. (MPEP § 2131).

Cohn's Invention:

Cohn discloses a plastic pin grid array package 1 that has a metal heat-sink 16 with a pair of surrounding plastic bonding sheets 18 that are interposed between a plastic top body 15 and plastic bottom body 17 that have outer surfaces with metallization 22, 23, respectively.

Cohn does not disclose an insulating substrate with a first side on a top side of the conductive substrate:

In rejecting claim 1, the Examiner equated Cohn's plastic top body 15 with applicants' insulating substrate, and stated that the insulating substrate has a first side on the top side of the conductive substrate. However, Cohn (Figure 3 and col. 4, lines 8-10) clearly shows a bonding sheet 18 interposed between the metal heat-sink 16 and the plastic top body 15. Due to this positioning of the bonding sheet 18, Cohn cannot have "an insulating substrate with a first side *on* the top side of the conductive substrate", as recited in applicants' claim 1 (*emphasis added*). Without this limitation of applicants' claim 1 being explicitly or inherently disclosed by Cohn, applicant's claim cannot be anticipated by Cohn. Accordingly, applicants respectfully request that the rejection under 35 U.S.C. § 102(b) be withdrawn on this ground.

Cohn does not show a conductive substrate having a bottom side defining a footprint of the device package:

In rejecting claim 1, the Examiner also equated Cohn's metal heat-sink 16 with applicants' "conductive substrate having a bottom side defining a footprint of the device package". Applicants' do not agree with the Examiner's characterization of the Cohn reference. Cohn (Figures 1-8; col. 2, lines 64-66) clearly shows the plastic bottom layer 17 below the metal heat-

sink 16. Cohn's metal heat-sink 16 does not define the footprint of Cohn's plastic pin grid array package 1. To the extent that Cohn's plastic pin grid array package 1 has a footprint, that footprint is defined by the plastic bottom layer 17, rather than the metal heat-sink 16. Because Cohn does not expressly or inherently disclose "a conductive substrate having a bottom side defining a footprint of the device package", applicants' claim 1 cannot be anticipated on this ground. Accordingly, applicants respectfully request that the rejection under 35 U.S.C. §102(b) be withdrawn on this ground.

Because the above elements of applicants' claim 1 are not found, expressly or inherently, in the Cohn reference, applicants' claim 1 cannot be anticipated by Cohn. Since claims 9, 13 depend on claim 1, these claims rejected under §102(b) are also patentable based on the patentability of claim 1.

Obviousness under 35 U.S.C. § 103(a), claims 2-4, 10-12, 14 (Cohn in view of Glenn):

A *prima facie* case of obviousness requires that the combination of the prior art references teach or suggest all limitations of applicants' claims. (MPEP 706.02(j)). Because there are claim limitations in the independent claim 1 that are not taught or suggested by the combination of the Cohn and Glenn references, applicants believe that a *prima facie* case of obviousness has not been established for the claims in the present case.

Glenn's Invention:

Glen discloses an integrated circuit package 10 (col. 2, lines 60-62) having an insulating substrate 11 that forms an insulating base of the package 10. A die 14 is mounted on an upper surface of the substrate 11. (col. 3, lines 16-17). A transparent encapsulant 29 is placed onto the die 14 and is retained by a bead 20. (col. 4, lines 63-65).

Applicants' argument for lack of anticipation of claim 1 by the Cohn reference applies. Even if there were motivation to combine Cohn's plastic pin grid array package 1 with Glenn's transparent encapsulant 29 and die 14 as suggested by the Examiner, and even if Glenn's transparent encapsulant 29 and die 14 were the same as applicants' optical device (claims 2-3) and encapsulant (claim 4), this combination does not suggest "a conductive substrate having a bottom side defining a footprint of the device package" and "an insulating substrate with a first side on the top side of the conductive substrate" as recited in applicants' claim 1. Claims 2-4 necessarily include all of the elements and limitations of claim 1 – elements and limitations that are not taught or suggested by the combination of Cohn and Glenn. To the extent that a footprint is defined by Cohn's plastic pin grid array package 1, that footprint is defined by the plastic bottom body 17, and not by a conductive substrate. Similarly, Glenn's integrated circuit package 10 has an insulating "substrate 11 [that] forms an insulating base to the package". (col. 2, line 60). To the extent that Glenn's integrated circuit package 10 has a footprint, that footprint is defined by the insulating substrate 11. It is clear from these references that the combination of Cohn and Glenn does not include "a conductive substrate...defining a footprint of the device package" as recited in applicants' claims. Accordingly, applicants' believe that the Examiner has not made a *prima facie* case of obviousness on this ground, and applicants respectfully request that the rejection of claims 2-4 be withdrawn.

Similar reasoning applies to the rejection of claims 10-12, 14. Even if there were motivation to combine Cohn's plastic pin grid array package 1 with Glenn's integrated circuit package 10 as posited by the Examiner, the above limitations of applicants' claim 1, inherently present in claims 10-12, 14, are not taught or suggested by the combination of Cohn and Glenn. Absent these claim limitations, a *prima facie* case of obviousness under 103(a) cannot be made. Applicants' respectfully request that the rejection of claims 10-12, 14 under 103(a) be withdrawn on this ground.

Obviousness under 35 U.S.C. § 103(a), claim 5 (Cohn in view of Ogihara):Ogihara's invention:

Ogihara discloses an integrated circuit package having an insulating substrate 4 with a semiconductor element 1 enclosed by the substrate 4 and an insulating cap 5. Leads 3 extend outside the periphery of the insulating substrate 4. A cooling fin 9 is adhered to the rear surface of the insulating substrate 4. (col. 5, lines 9-14).

In rejecting claim 5, the Examiner stated that it would have been obvious for the conductive tabs of Cohn to be gull-wings as taught by Ogihara to provide leads that provide surfaces to be wire bonded to the device and solderable to a substrate surface. However, Ogihara's Figure 2 shows that the integrated circuit package has a footprint defined by the cap 5. When Cohn and Ogihara are combined, this combination does not result in "a conductive substrate...defining a footprint of the device package". Absent a teaching or suggestion of this feature inherent in applicants' claim 5, applicants' claim 5 cannot be obvious over Cohn in view of Ogihara. In addition, even if there were motivation to combine Cohn and Ogihara, Ogihara's leads 3 are not coupled to corresponding contact sites via signal paths coupling to an aperture, as recited in applicants' claim 1. In fact, Ogihara does not disclose such an aperture in an insulating substrate. To the contrary, Ogihara explicitly shows that the semiconductor element is mounted on the insulating substrate. (Figures 2-4; col. 3, lines 3-4). Since the above features of applicants' claims are not taught or suggested by Cohn and Ogihara, claim 5 is believed to be allowable over these references.

There is no suggestion or motivation to combine the Ogihara's integrated circuit package with Cohn's plastic pin grid array package:

The *prima facie* case of obviousness also requires that there be some suggestion or motivation to combine the reference teachings. (MPEP 706.02(j)). The Examiner concluded that it would have been obvious to one having ordinary skill in the art at the time the invention was made

to include Ogihara's leads 3 into Cohn's plastic pin grid array package 1. In Cohn's pin grid array package 1, pins 3 are disposed over the entire surface of the plastic top and bottom bodies 15, 17 that is not occupied by the integrated circuit device 4 (Figure 3). In fact Cohn includes an encapsulant retaining dam 5 to contain the extent of the encapsulant so that pins 3 can be disposed over internal regions of the plastic pin grid array package 1, not the periphery of the package. "A prior art reference must be considered in its entirety, as a whole, including portions that would lead away from the claimed invention." (MPEP 2141.02). Accordingly, there is no motivation in a pin grid array package 1 to include gull wings that are disposed about the periphery of a conductive substrate as recited in applicants' claim 5. By its nature a *pin* grid array package, such as Cohn's, necessarily includes *pins* and not gull wings. Claim 5 is believed to be allowable on the independent ground that there is a lack of motivation or suggestion to combine the teachings of Cohn and Ogihara.

Obviousness under 35 U.S.C. § 103(a), claims 6-8 (Cohn in view of Glenn further in view of Ogihara):

In rejecting claims 6-8 the Examiner stated that it would have been obvious for the conductive tabs of Cohn to be gull-wings as taught by Ogihara in order to provide leads that provide surfaces to be wire bonded to the device and solderable to a substrate surface.

Applicant's above arguments apply to this rejection by the Examiner. When Cohn and Ogihara are combined, this combination does not result in "a conductive substrate...defining a footprint of the device package". Absent a teaching or suggestion of this feature inherent in applicants' claims 6-8, applicants' claims 6-8 cannot be obvious over Cohn, Glenn and Ogihara. Ogihara's leads 3 are not coupled to corresponding contact sites via signal paths coupling to an aperture, as recited in applicants' claim 1. Ogihara does not disclose such an aperture in an insulating substrate. In a pin grid array package 1 as disclosed by Cohn, pins 3 are disposed over the entire surface of the plastic

top and bottom bodies 15, 17 that is not occupied by the IC device 4. Due to the nature of Cohn's *pin* grid array package 1 where pins are disposed over internal regions of the plastic pin grid array package 1, *pins* and not gull wings are necessarily included. The Cohn reference must be considered in its entirety, as a whole, including portions of the reference that would lead away from applicants' claimed invention.

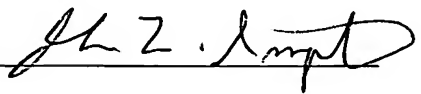
Applicants' claims 6-8 necessarily include the features of applicants' claim 1. Because these features are not taught or suggested in the combination of Cohn, Glenn and Ogihara, and because there is no suggestion or motivation to combine these references, applicants' claims cannot be obvious in view of these references.

CONCLUSION

The recited elements of applicant's claim 1 are not explicitly or inherently shown in the Cohn reference. Therefore, applicant's claim cannot be anticipated under 35 U.S.C. §102(b). The rejection under 35 U.S.C. §102(b) is believed to have been overcome, and claims 1, 9, 13 are believed patentable over the prior art. Applicants believe that a *prima facie* case of obviousness has not been made for the rejection claims 2-4, 10-12, 14 on the grounds that Cohn in view of Glenn does not teach or suggest all the limitations of applicants claims. Applicants also believe that a *prima facie* case of obviousness has not been made for the rejection claim 5 (Cohn in view of Ogihara) and claims 6-8 (Cohn in view of Glenn further in view of Ogihara).

Applicants respectfully request that the rejections under 35 U.S.C. §§102(b), 103(a) be withdrawn and that claims 1-14 be allowed. If the Examiner has any questions or would like to discuss this application in more detail, she/he is invited to call the applicants' attorney at the telephone number given below.

Respectfully submitted,

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